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AUTHOR Olstad, Roger G.; And Others
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ABSTRACT

Two studies sought to identify variables that might predict relative success in student teaching performance. University supervisors ranked program graduates on overall student teaching success after they had successfully completed all mastery criteria. The first study compared students on achievement test scores, grade point average (GPA), and mastery criteria to identify differences among program graduates ranked high, middle, and low on overall student teacher success. The second study was a replication of the first, and it examined similar variables measured at several points in the program. A comparison was made of student groups ranked high and low on overall performance using the measures of GPA, the California Achievement Test (CAT), and the Performance Based Evaluation Instrument (PBEI). Although results were mixed at the secondary school level, two possible predictors appeared at the elementary school level: (1) GPA of an elementary school intern at the beginning of the program; and (2) PBEI scores at the end of the third of four student teaching quarters. A comparison of the groups on the CAT did not support this selection criterion as a predictor of teaching success. Appended tables present data on total group contrasts in all three measures and a complete data analysis of the two studies. (JD)

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Preservice Teaching Performance:

A Search for Predictor Variables

Final Report

TEACHER EDUCATION RESEARCH CENTER

Research Report No. 83-3

College of Education

University of Washington

June 1983

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Roger G. Olstad
Jack L. Beal
Katherine L. Schlick Noe
Christine C. Schaefer

SP022701

Abstract

In an effort to identify variables predictive of preservice teaching success, two studies compared groups of interns ranked by University Supervisors as high, middle, and low on overall teaching performance on achievement test scores, grade point average, and mastery criteria. Results identified possible predictor variables at the elementary, but not at the secondary, level.

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INTRODUCTION

The evaluation of student teachers is an important process in a teacher certification program; institutions of higher learning involved in teacher education must be responsible for the graduates that they send into the K-12 schools. Many different approaches to evaluation have been forwarded, approaches that reflect the ideological thrust of the programs and the people who devise them. Some approach the evaluation of student teachers from the behavioral point of view: teaching is seen as a quantifiable, measurable process. Others approach evaluation from a more humanistic, process-oriented approach. In this, the process is less quantifiable than impressionistic, with attempts toward qualitative concerns not involved with numbers and measurement. Instruments that measure and evaluate student teachers can differ substantially, depending on the ideology of the program.

Whatever system is used for the evaluation of student teachers, and there are many available, they are generally designed as evaluative instruments, and not as research instruments. Responsibility for the quality of the new teachers has led institutions to develop instruments that measure whatever is regarded as essential in the ideology most compatible with the program. While research in teacher education is important in many colleges of education, the instruments available, which reflect a concern for evaluation, tend to be based on a model of mastery. In such a model, student teachers are observed and guided with the attainment of mastery as the final goal. Mastery is either reached or the student teacher leaves the

program, either at the institution's request or at the student's initiative. This allows little remaining variance among the graduates of the program, all of whom have "mastered" the appropriate, prescribed levels of the important behaviors. Identifying behaviors or indicators that might predict relative success in teaching is not possible from mastery model evaluation instruments since their focus is on achieving outcomes rather than describing individual differences.

To solve this problem at the University of Washington, an alternative system of classification was devised, one that does not involve evaluation per se, although a mastery evaluation model is its base. Student teachers were examined retrospectively, after successfully completing mastery criteria, to identify qualities that might correlate with their relative successes in teaching. University Supervisors ranked program graduates on overall teaching success. The purpose of this ranking system was to impose greater variability among the student teachers to generate comparative data.

Two studies examined students classified according to this ranking system. Study 1 compared students on achievement test scores, grade-point average, and mastery criteria to identify differences among program graduates ranked as high, middle, and low on overall teaching success. Study 2 was a replication of Study 1 and examined similar variables measured at several points in the program.

PROCEDURE

Study 1

University Supervisors were asked to rank-order all of the student teachers they had supervised who had successfully completed the program during the calendar year 1981, a period of three quarters. A single criterion was used for ranking--overall teaching performance as a student teacher.

After the program graduates had been ranked, each supervisor's list was divided into thirds to create a high, middle, and low group according to overall teaching performance. The examiners decided that the top and bottom groups represented more easily defined differences with the middle group likely to be less distinct. By this system, then, variability was imposed upon a group of students who had mastered the specific areas required for successful completion of a program.

After each supervisor's rankings were divided into thirds, students at each level were grouped according to the following categories: all students, regardless of supervisor, who were ranked in the top third became Group 1; all who were ranked in the middle third became Group 2; and all who were ranked in the bottom third became Group 3. For the lists of students who did not divide equally into thirds, the extra students were added to the middle category. Although contrasts among all groups were analyzed (Appendixes A and B), only the differences between the extreme groups (Groups 1 and 3) were selected as indicators of variability.

The number of students ranked per supervisor varied from 1 to 23. The rankings of very small groups of students could not validly be compared with rankings of large groups of students. For example, a student ranked in the upper third of a group of three might not maintain the same rank as in a group of 20. To avoid this problem, the mean number of students per supervisor was calculated. This average was used as the selection criterion for the University Supervisors' participation, which was limited to those supervisors whose number of students was equal to or greater than the mean.

Six elementary and eight secondary supervisors were eligible and participated in Study 1. The number of students managed by the participating University Supervisors ranged from 8 to 23, with 95 students ranked at each level, elementary and secondary. The total number of students ranked in Study 1 was 192; two subjects were dropped from the study for lack of data after the grouping was completed.

For all analysis in Studies 1 and 2, elementary and secondary level interns were regarded separately.

Study 2

The procedure was the same as in Study 1. Using the same criterion--overall teaching performance as a student teacher, University Supervisors ranked all elementary and secondary program graduates they had supervised during the calendar year 1982. The mean number of students managed by the University Supervisors was the same in both studies. However, the range of

students assigned to supervisors was smaller in Study 2, thus reducing the total number of students in the study. Despite this difference, similar selection criteria, program components, entering grade point average (Study 1, $\bar{x}$ = 3.14; Study 2, $\bar{x}$ = 3.15), and California Achievement Test total scores (Study 1, $\bar{x}$ = 205.47; Study 2, $\bar{x}$ = 205.46) give reasonable assurance that the students in both studies represent the same population and had similar experiences in the program.

Eight elementary and six secondary supervisors were eligible and participated in the study. One eligible secondary supervisor was dropped because she was no longer employed by the program. The number of students managed by the participating University Supervisors ranged from 8 to 14, with 80 students ranked at the elementary level, and 58 ranked at the secondary level.

Students were grouped according to the categories reported in Study 1. The total number of students ranked was 141; three subjects were dropped from the study for lack of data.

Table 1 shows the results of the categorizations for Studies 1 and 2.

ANALYSIS

The groups were compared against various criterion measures using the F test and Scheffe's multiple comparison test. The F test, with criterion level at .05, was used to determine the presence of significant differences

for each variable. Scheffe's more powerful test was used to locate the specific sources of significant differences at a criterion level of .10.

TABLE 1
Student Participants by Group and Level

Elementary

	Group 1	Group 2	Group 3	Total Secondary
Study 1	n = 29	n = 37*	n = 29	n = 95
Study 2	n = 25	n = 30**	n = 25	n = 80

Secondary

	Group 1	Group 2	Group 3	Total Secondary
Study 1	n = 30	n = 36	n = 29	n = 95
Study 2	n = 17	n = 24	n = 17	n = 58

* = Group from which one subject was lost.
** = Group from which three subjects were lost.

Study 1

The initial measures of interest for comparison were final University of Washington cumulative grade point average (GPA); major subtest (reading, spelling, language, and math) and total scores on the California Achievement Test (CAT); and subcategories and total scores on the final

Performance Based Evaluation Instrument (PBEI), a mastery-model evaluation measure on which students in the University of Washington Teacher Certification Program are evaluated as teachers. Observed behaviors are collapsed into eleven categories. Each program graduate is evaluated by a University Supervisor several times during his or her tenure in the classroom as a student teacher. Study 1 examined final PBEI scores only, comparing these to the groups derived from the ranking of the students. This serves as a measure of validity for the post hoc ratings of the University Supervisors.

Final University of Washington cumulative grade point average was the only GPA measure available at the time of Study 1. To determine the value of GPA as an admission criterion related to teaching success, however, the total University of Washington GPA at the time of program entry was calculated. This measure was determined on the basis of the last 60 credits earned before entry into the Teacher Certification Program. A post hoc analysis of entry GPA was then performed on the Study 1 sample.

Study 2

In order to identify variables related to teaching success, Study 2 analyzed criterion measures taken at several points in the student teaching program. These criterion measures of interest included entry GPA and subcategory and total scores on the final PBEI as well as PBEI evaluations taken at intermediate points in the program. For the elementary program graduates, intermediate PBEI scores were assigned at the end of the third

quarter in a four-quarter program. At the secondary level, intermediate PBEI scores were assessed at the end of the second quarter in a three-quarter program. California Achievement Test subtest and total scores were also analyzed in Study 2.

Although students in both Study 1 and Study 2 were required to take the CAT before entry into the program, their scores were not used in the admission decision, but rather to establish baseline data upon which later selection criteria would be decided. Thus, no students were excluded from this analysis as a result of non-admission due to "low" scores.

FINDINGS

Table 2 summarizes the results of the comparisons for the selection criterion measures for Studies 1 and 2. Group 1 is the highest one-third of student teachers ranked on overall teaching performance, and Group 3 is the lowest ranked. Therefore, 1-3 is the comparison of Group 1 (highest) with Group 3 (lowest). The words "YES" and "NO" in the contrast columns refer to whether or not a significant difference was found at the .05 level of significance. In all cases where significant differences were found, Group 1 had the higher value (identified by Scheffe's criterion level of .10).

Appendixes A and B show complete summaries of all group contrasts. Appendixes C and D show a complete summary of the data analysis, including all group means, F tests, and significance levels.

TABLE 2
Comparison of Student Groups Ranked High and Low
on Overall Teaching Performance: ALL MEASURES

	Group Contrasts 1-3 Study 1	1-3 Study 2
GPA: FINAL		
Elementary	NO	---
Secondary	NO	---
GPA: ENTRY		
Elementary	YES	YES
Secondary	YES	NO
CAT		
Elementary--Total and all Subtests	NO	NO
Secondary--Total and all Subtests	NO	NO
PBEI: INTERMEDIATE		
Elementary--Total and all Subcategories	---	YES
Secondary--Total and all Subcategories	___	NO
PBEI: FINAL		
Elementary--Total and all Subcategories	YES	YES
Secondary--Total and all Subcategories	YES	---
Total and all Subcategories except for:	---	NO
b. Demonstrates academic preparation		YES
e. Develops instructional objectives		YES
f. Organizes instruction to achieve objectives		YES
g. Manages learning environment		YES
i. Promotes instructional interaction		YES
j. Evaluates achievement of objectives		YES

YES indicates significant differences at .05 level.
NO indicates no significant difference at .05 level.
In all cases where significant differences were found (indicated by YES), Group 1 had the higher value.

Grade Point Average

Grade point average (GPA) was examined by group--high and low--as derived from the ranking of the program graduates on overall teaching performance by their University Supervisors. The results of comparisons on entry and final GPA were examined by level.

Study 1

Elementary. For the elementary program graduates, no significant differences were found between groups for final GPA. For entry GPA, Group 1 was significantly higher than Group 3.

Secondary. For the secondary level graduates, no significant differences were found between groups for final GPA. For entry GPA, Group 1 was significantly higher than Group 3.

Study 2

Elementary. Group 1 had a significantly higher mean entry GPA than Group 3.

Secondary. No significant differences were found between Groups 1 and 3 for entry GPA.

California Achievement Test

All students entering the program were required to take the California Achievement Test (CAT). The results on the several categories of the CAT and the total score were examined by level.

Study 1

Elementary. For the elementary program graduates, no significant differences were found between groups on any category of the CAT.

Secondary. No significant differences were found between groups on any category of the CAT.

Study 2

Elementary. No significant differences were found between groups on any category of the CAT.

Secondary. No significant differences were found between groups on any category of the CAT.

The California Achievement Test is now required before entry into the program as a selection criterion. Because this test is administered before the sequence of courses and student teaching, predictive value was expected. However, no relationship was found between the CAT or its subtests and overall teaching performance at the elementary or secondary levels.

Performance Based Evaluation Instrument

The Performance Based Evaluation Instrument (PBEI) is the set of behaviors on which students in the University of Washington Teacher Certification Program are evaluated as teachers. The results of group comparisons on intermediate and final PBEI scores were examined by level.

Study 1

Elementary. For the elementary program graduates, Group 1 was significantly higher than Group 3 on every measure of the final PBEI.

Secondary. Group 1 was significantly higher than Group 3 on every measure of the final PBEI

This analysis indicates that the detailed assessments that the supervisors had completed during the previous year were consistently applied to the broader assessment of student rankings.

Study 2

Elementary. Significant differences were found on every measure of the final and intermediate PBEI. For all eleven subcategories and the total PBEI scores, Group 1 scored significantly higher than Group 3.

Secondary. No significant differences were found on any measure of the intermediate PBEI. For the final PBEI, the results were mixed. Significant differences between groups were found only for six of the eleven subcategories. No significant differences were found on five subcategory and the total scores of the final PBEI. Specific results follow for the six subcategories where differences were found:

b. Demonstrates academic preparation

Group 1 scored significantly higher than Group 3

e. Develops instructional objectives

Group 1 scored significantly higher than Group 3

f. Organizes instruction to achieve objectives

Group 1 scored significantly higher than Group 3

g. Manages learning environment

Group 1 scored significantly higher than Group 3

i. Promotes instructional interaction

Group 1 scored significantly higher than Group 3

j. Evaluates achievement of objectives

Group 1 scored significantly higher than Group 3

The analysis of the intermediate PBEI indicates that at the elementary level, this measure may provide predictive information about teaching performance. At the secondary level, however, the intermediate PBEI does not have this same predictive potential.

CONCLUSIONS

Some important patterns are apparent in these results in which overall teaching performance was compared against the criterion measures of grade point average, California Achievement Test scores, and Performance Based Evaluation Instrument ratings. Clearly, elementary- and secondary-level student teachers represent different populations on important measures and should be examined in separate analyses, although analyses produced similar results on the measures of GPA and CAT. The lack of significant differences for final GPA at both levels is important; for accurate interpretation, the range of GPA's must also be examined. If the range is limited, then variability would also be limited, and the groups are less likely to look significantly different on this variable.

The GPA analysis, however, suggests a possible predictive value for incoming GPA. This measure identified differences between groups at the elementary level for both studies. The results at the secondary level were mixed; it is not clear if this measure is related to teaching performance for secondary-level student teachers.

Important information was derived from the comparison of the post hoc ranking and the scores on the final Performance Based Evaluation Instrument. Supervisors were asked to rank a combined list of students from three different quarters in each study. Group 1 differed significantly from Group 3 on all measures at the elementary level in both studies and at

the secondary level in Study 1. Again, the mixed results on this measure at the secondary level in Study 2 make interpretation difficult. However, the overall consistency of results from this analysis lends validity to the post hoc rankings that the supervisors completed. Some of the graduates had completed the program almost a year before they were ranked. These results indicate that over time, the supervisors have used consistent evaluation criteria that remain constant during a comprehensive analysis. Whether the same results would occur if the supervisors had not completed the PBEI on each of the students before the ranking is not known.

Students are evaluated on the PBEI at several points in their program. Study 2 assessed the relationship of intermediate PBEI scores to overall teaching performance for elementary and secondary student teachers. The results suggest that these evaluations at the end of an elementary-level student teacher's third quarter may target students who will need additional assistance. Such early identification may give the University Supervisors time to work with the student to strengthen teaching performance behaviors. As a result of the analysis, the same relationship cannot be found for intermediate PBEI scores at the secondary level.

The comparison of groups on the California Achievement Test does not support this selection criterion as a predictor of teaching success. Students entering the Teacher Certification Program are now selected, in part, on the basis of their scores on the CAT. The analysis of the California Achievement Test for both elementary and secondary levels in

Studies 1 and 2 produced no significant differences between the highest- and lowest-ranked groups on the total or subtest scores. Although the CAT is not predictive of overall teaching success, it is believed that screening to identify students whose lack of basic skills would prevent them from successfully completing the program remains important.

The purpose of these studies was to identify variables that might predict relative success in student teaching performance. Although the results were mixed at the secondary level, two possible predictors appear at the elementary level: (a) the GPA of an elementary intern at the beginning of the program, and (b) the scores on the PBEI at the end of the third of four student teaching quarters. The identification of these and other possible predictive variables will aid the process of developing successful teachers.

(78)D

APPENDIX A
STUDY 1
Total Group Contrasts: all Measures

	Group Contrasts		
	1-2	1-3	2-3
GPA: FINAL			
Elementary	NO	NO	NO
Secondary	NO	NO	NO
GPA: ENTRY			
Elementary	YES (1)	YES (1)	NO
Secondary	NO	YES (1)	NO
CAT			
Elementary			
READ	YES (1)	NO	NO
SPELL	YES (1)	NO	YES (3)
LANG	YES (1)	NO	YES (3)
MATH	YES (1)	NO	NO
Total	YES (1)	NO	NO
Secondary			
READ	NO	NO	NO
SPELL	NO	NO	NO
LANG	NO	NO	NO
MATH	NO	NO	NO
Total	NO	NO	NO
PBEI: FINAL			
Elementary			
Total and all Subtests except for	NO	YES (1)	YES (2)
a. Demonstrates academic preparation	YES (1)	YES (1)	YES (2)
b. Develops instructional objectives	YES (1)	YES (1)	YES (2)
Secondary			
Total and all Subtests	NO	NO	NO

YES indicates significant differences at .05 level.
NO indicates no significant difference at .05 level.
Numbers in parentheses indicate the group with the higher value identified by Scheffe's criterion level of .10

APPENDIX B
STUDY 2
Total Group Contrasts: all Measures

	Group Contrasts		
	1-2	1-3	2-3
GPA: ENTRY			
Elementary	YES (1)	YES (1)	NO
Secondary	NO	NO	NO
CAT			
Elementary Total and all Subtests	NO	NO	NO
Secondary Total and all Subtests	NO	NO	NO
PBEI: INTERMEDIATE			
Elementary			
Total and all Subcategories except for:	NO	YES (1)	YES (2)
a. Exhibits professional qualifications	NO	YES (1)	NO
b. Demonstrates academic preparation	NO	YES (1)	NO
f. Organizes instruction to achieve objectives	NO	YES (1)	NO
k. Uses evaluation results	NO	YES (1)	NO
Secondary			
Total and all Subcategories	NO	NO	NO
PBEI: FINAL			
Elementary			
Total and all Subcategories except for:	NO	YES (1)	YES (1)
a. Diagnoses learner characteristics	NO	YES (1)	NO

Continued.....

APPENDIX B (continued)

	Group Contrasts		
	1-2	1-3	2-3
PBEI: FINAL (continued)			
Secondary			
Total and all Subcategories except for:	NO	NO	NO
b. Demonstrates academic preparation	NO	YES (1)	YES (2)
d. Diagnoses learner characteristics	NO	NO	YES (2)
e. Develops instructional objectives	NO	YES (1)	YES (2)
f. Organizes instruction to achieve objectives	NO	YES (1)	YES (2)
g. Manages learning environment	YES (1)	YES (1)	NO
i. Promotes instructional interaction	NO	YES (1)	YES (2)
j. Evaluates achievement of objectives	NO	YES (1)	YES (2)

YES indicates significant differences at .05 level.
NO indicates no significant difference at .05 level.
Numbers in parentheses indicate the group with the higher value identified by Scheffe's criterion level of .10

APPENDIX C
STUDY 1
Complete Data Analysis: All Measures

	Group N			Group $\bar{X}$			Group Stnd. Dev.			D.F.		Sum of Squares		Mean Squares		F Ratio	F Prob.
	1	2	3	1	2	3	1	2	3	BG	WG	BG	WG	BG	WG		
GPA: FINAL																	
Elementary	29	35	28	2.78	2.46	3.10	1.810	2.340	2.490	2	92	37.963	463.763	18.98	5.040	3.765	.0260
Secondary	28	35	29	3.02	2.87	3.02	1.299	1.090	.707	2	89	47.480	9987.176	23.740	112.215	.212	.8097
GPA: ENTRY																	
Elementary	29	37	28	3.23	3.01	3.03	.384	.369	.375	2	91	1.426	12.883	.713	.141	5.030	.0084
Secondary	29	34	28	3.31	3.13	3.07	.401	.365	.393	2	88	.861	13.111	.442	.149	2.960	.0565
CAT																	
Elementary																	
READ	29	37	29	65.10	61.56	62.58	4.012	5.444	4.547	2	92	209.026	2096.805	104.513	22.791	4.586	.0126
SPELL	29	37	29	17.27	14.83	17.06	2.068	2.862	1.907	2	92	123.738	516.682	61.869	5.616	11.016	.0001
LANG	29	37	29	53.17	49.29	52.37	5.745	4.545	4.836	2	92	282.462	2322.695	141.231	25.246	5.594	.0051
MATH	29	37	29	70.72	63.86	64.51	8.070	12.181	13.023	2	92	877.272	11915.358	438.636	129.514	3.387	.0381
Total	29	37	29	206.27	189.56	196.55	14.017	21.105	21.136	2	92	4541.153	34046.046	2270.576	370.065	6.136	.0032
Secondary																	
READ	29	36	29	63.93	65.61	63.79	5.091	3.314	5.796	2	91	68.228	2051.176	34.114	22.540	1.513	.2256
SPELL	29	36	29	17.37	16.69	15.82	1.740	3.078	3.252	2	91	35.097	712.604	17.548	7.830	2.241	.1122
LANG	29	36	29	55.48	53.19	53.75	4.154	6.126	7.772	2	91	88.288	3488.190	44.144	38.331	1.152	.3207
MATH	29	36	29	74.65	69.94	71.62	10.984	12.202	12.479	2	91	360.050	12951.260	180.020	142.320	1.265	.2872
Total	29	36	29	211.44	205.44	205.00	18.602	20.290	26.660	2	91	774.540	44016.060	387.27	583.690	.801	.4522
PBEI: FINAL																	
Elementary Total	--	--	--	--	--	--	--	--	--	2	92	2011.850	4620.670	1005.92	50.720	20.029	.0000
a. Exhibits profesional qualifications	29	36	29	4.89	4.88	4.00	.409	.398	.707	2	91	15.960	24.240	7.98	.266	29.966	.0000
b. Demonstrates academic preparation	29	36	29	4.79	4.41	3.82	.491	.603	.759	2	91	13.760	35.640	6.88	.391	17.570	.0000
c. Exhibits personal attributes	29	36	29	4.89	4.80	3.82	.409	.467	.601	2	91	20.930	22.460	10.46	.246	42.400	.0000
d. Diagnoses learner characteristics	29	36	29	4.82	4.63	3.75	.384	.542	.635	2	91	19.224	25.753	9.612	.283	33.960	.0000

APPENDIX C (Continued - 2)

	Group N			Group $\bar{X}$			Group Stnd. Dev.			D.F.		Sum of Squares		Mean Squares		F Ratio	F Prob.
	1	2	3	1	2	3	1	2	3	BG	WG	BG	WG	BG	WG		
PBEI: FINAL (continued)																	
e. Develops instructional objectives	29	35	29	4.79	4.45	3.72	.491	.610	.701	2	90	17.429	33.237	8.710	.369	23.597	.0000
f. Organizes instruction to achieve objectives	29	36	29	4.75	4.61	3.68	.511	.598	.760	2	91	19.895	36.072	9.946	.396	25.095	.0000
g. Manages learning environment	28	36	29	4.67	4.55	3.62	.475	.734	.727	2	90	19.746	39.823	9.873	.442	22.313	.0000
h. Facilitates instructional objectives	29	36	29	4.68	4.52	3.68	.541	.608	.603	2	91	17.039	31.386	8.519	.344	24.702	.0000
i. Promotes instructional objectives	29	35	28	4.86	4.80	3.82	.441	.472	.548	2	89	19.801	21.155	9.900	.237	41.651	.0000
j. Evaluates achievement of objectives	29	36	28	4.72	4.47	3.64	.527	.559	.731	2	90	18.376	33.193	9.188	.368	24.912	.0000
k. Uses evaluation results	29	35	29	4.72	4.68	3.72	.591	.529	.591	2	90	19.150	29.129	9.575	.323	29.585	.0000
Secondary Total	29	36	29	54.20	52.63	46.62	1.110	3.390	7.310	2	91	944.450	1937.890	472.220	21.290	22.175	.0000
a. Exhibits professional qualifications	29	36	29	5.00	4.97	4.48	0.000	.166	.687	2	91	5.063	14.213	2.531	.156	16.207	.0000
b. Demonstrates academic preparation	29	36	29	4.93	4.86	4.31	.257	.424	.760	2	91	6.870	24.374	3.435	.267	12.825	.0000
c. Exhibits personal attributes	29	36	29	5.00	4.88	4.37	0.000	.398	.775	2	91	6.467	22.383	3.234	.246	13.148	.0000
d. Diagnoses learner characteristics	29	35	28	4.89	4.74	4.21	.309	.505	.786	2	89	7.345	28.089	3.672	.315	11.636	.0000
e. Develops instructional objectives	29	36	28	4.89	4.75	4.21	.309	.500	.738	2	90	7.416	26.153	3.708	.290	12.760	.0000
f. Organizes instruction to achieve objectives	29	36	28	5.00	4.75	4.21	0.000	.500	.786	2	90	9.202	25.464	4.601	.282	16.262	.0000
g. Manages learning environment	29	36	29	4.89	4.75	4.06	.309	.439	.798	2	91	11.517	27.301	5.758	.300	19.194	.0000
h. Facilitates instructional objectives	29	36	29	4.82	4.80	4.17	.384	.401	.759	2	91	8.298	25.914	4.149	.284	14.569	.0000
i. Promotes instructional interaction	29	36	29	4.93	4.77	4.41	.257	.484	.732	2	91	4.125	25.118	2.063	.276	7.474	.0010
j. Evaluates achievement of objectives	29	36	27	4.89	4.72	4.33	.309	.454	.733	2	89	4.642	23.911	2.321	.268	8.640	.0004
k. Uses evaluation results	29	36	27	4.93	4.75	4.22	.257	.439	.800	2	89	7.590	25.278	3.795	.284	13.363	.0000

APPENDIX D
STUDY 2
Complete Data Analysis: All Measures

	Group N			Group $\bar{X}$			Group Stnd. Dev.			D.F.		Sum of Squares		Mean Squares		F Ratio	F Prob.
	1	2	3	1	2	3	1	2	3	BG	WG	BG	WG	BG	WG		
GPA: ENTRY																	
Elementary	25	30	25	3.18	3.16	2.83	.322	.363	.465	2	79	1.9365	11.503	.968	.149	6.481	.0025
Secondary	17	22	17	3.22	3.24	3.09	.455	.353	.443	2	53	.252	9.089	.126	.171	.735	.4841
CAT																	
Elementary																	
READ	22	27	25	63.36	64.66	64.08	5.323	3.293	6.231	2	71	20.582	1808.930	10.291	25.477	.404	.6692
SPELL	22	27	25	16.72	16.29	15.84	1.750	2.198	2.995	2	71	9.241	405.353	4.620	5.709	.809	.4492
LANG	22	27	25	55.54	54.33	54.44	3.661	4.645	4.546	2	71	20.980	1343.614	10.490	18.924	.554	.5769
MATH	22	27	25	74.45	72.81	69.08	6.967	9.298	13.886	2	71	363.509	7895.368	181.754	111.202	1.634	.2023
Total	22	27	25	210.09	208.11	203.44	12.656	13.989	21.939	2	71	559.260	20004.644	279.630	281.755	.992	.3757
Secondary																	
READ	13	18	14	64.15	64.55	62.85	3.330	4.380	4.480	2	42	23.793	721.851	11.896	17.186	.692	.5061
SPELL	13	18	14	16.53	16.83	16.00	2.665	1.823	2.631	2	42	5.513	231.730	2.756	5.517	.500	.6103
LANG	13	18	14	52.30	53.88	50.78	5.513	6.096	4.475	2	42	76.295	1256.904	38.147	29.926	1.275	.2901
MATH	13	18	14	67.07	74.16	70.28	12.539	6.537	11.193	2	42	387.364	4242.280	193.682	101.006	1.918	.1596
Total	13	18	14	200.07	209.44	199.92	18.526	15.222	14.891	2	42	963.481	10946.296	481.740	260.626	1.848	.1701
PBEI: FINAL																	
Elementary Total	25	30	25	51.40	49.83	41.00	9.133	10.596	15.052	2	77	1599.520	10696.166	799.760	138.911	5.457	.0047
a. Exhibits profesional qualifications	25	29	23	4.84	4.89	4.43	.374	.309	.662	2	74	3.103	15.701	1.551	.212	7.313	.0013
b. Demonstrates academic preparation	25	29	22	4.84	4.68	4.36	374	.470	.658	2	73	2.750	18.657	1.375	.255	5.380	.0066
c. Exhibits personal attributes	25	29	23	4.84	4.82	4.17	.374	.384	.716	2	74	7.015	18.802	3.508	.254	13.806	.0000
d. Diagnoses learner characteristics	24	29	22	4.83	4.58	4.31	.481	.627	.779	2	72	3.046	29.140	1.523	.404	3.763	.0279
e. Develops instructional objectives	24	29	23	4.79	4.55	4.13	.509	.685	.757	2	73	5.260	31.739	2.630	.434	6.050	.0037
f. Organizes instruction to achieve objectives	24	29	23	4.87	4.68	4.04	.448	.541	.767	2	73	9.001	25.788	4.500	.353	12.740	.0000

APPENDIX D (Continued - 2)

	Group N			Group $\bar{X}$			Group Stnd. Dev.			D.F.		Sum of Squares		Mean Squares		F Ratio	F Prob.
	1	2	3	1	2	3	1	2	3	BG	WG	BG	WG	BG	WG		
PBEI: FINAL (continued)																	
g. Manages learning environment	24	29	22	4.70	4.58	4.00	.550	.568	.872	2	72	6.593	31.992	3.296	.444	7.420	.0012
h. Facilitates instructional objectives	24	29	22	4.79	4.62	4.09	.414	.621	.811	2	72	6.115	28.604	3.057	.397	7.697	.0009
i. Promotes instructional interaction	24	29	23	4.87	4.72	4.13	.337	.527	.868	2	73	7.328	27.026	3.664	.370	9.897	.0002
j. Evaluates achievement of objectives	24	29	22	4.79	4.65	4.00	.509	.552	.690	2	72	8.236	24.510	4.118	.340	12.098	.0000
k. Uses evaluation results	23	29	22	4.95	4.72	3.95	.208	.591	.722	2	71	12.458	21.704	6.229	.305	20.377	.0000
Secondary Total	17	23	17	28.35	33.17	24.23	26.282	24.944	23.710	2	54	793.473	33736.245	396.736	624.745	.635	.5338
a. Exhibits professional qualifications	10	15	9	4.90	4.86	4.66	.316	.351	.707	2	31	.307	6.633	.153	.214	.719	.4950
b. Demonstrates academic preparation	10	15	9	4.70	4.66	4.00	.483	.488	.500	2	31	3.066	7.433	1.533	.239	6.395	.0047
c. Exhibits personal attributes	10	15	9	4.80	4.53	4.22	.632	.516	.441	2	31	1.581	8.888	.790	.286	2.758	.0790
d. Diagnoses learner characteristics	9	15	9	4.55	4.80	4.00	.726	.414	.500	2	30	3.620	8.622	1.810	.287	6.298	.0052
e. Develops instructional objectives	9	15	9	4.77	4.60	4.11	.441	.507	.600	2	30	2.198	8.044	1.099	.268	4.098	.0267
f. Organizes instruction to achieve objectives	9	15	9	4.66	4.66	4.00	.707	.488	.707	2	30	2.909	11.333	1.454	.378	3.850	.0325
g. Manages learning environment	9	15	9	4.88	4.33	4.00	.333	.617	.500	2	30	3.656	8.222	1.828	.274	6.671	.0040
h. Facilitates instructional objectives	9	15	9	4.66	4.40	4.33	.707	.507	.500	2	30	.581	9.600	.290	.320	.909	.4137
i. Promotes instructional interaction	9	15	9	4.66	4.66	4.11	.707	.488	.333	2	30	2.020	0.222	1.010	.274	3.686	.0371
j. Evaluates achievement of objectives	9	15	9	4.77	4.73	4.22	.441	.457	.441	2	30	1.834	6.044	.917	.201	4.552	.0188
k. Uses evaluation results	9	15	9	4.55	4.60	4.11	.726	.507	.609	2	30	1.470	10.711	.735	.357	2.060	.1452
PBEI: INTERMEDIATE																	
Elementary Total	19	24	21	51.36	49.91	44.14	4.152	4.614	5.720	2	61	603.033	1454.825	301.516	23.849	12.642	.0000
a. Exhibits profesional qualifications	19	24	21	4.89	4.79	4.38	.315	.414	.740	2	61	3.049	16.700	1.524	.273	5.570	.0060
b. Demonstrates academic preparation	19	24	21	4.68	4.50	4.14	.477	.510	.727	2	61	3.073	20.676	1.536	.339	4.533	.0146

APPENDIX D (Continued - 3)

	Group N			Group $\bar{X}$			Group Stnd. Dev.			D.F.		Sum of Squares		Mean Squares		F Ratio	F Prob.
	1	2	3	1	2	3	1	2	3	BG	WG	BG	WG	BG	WG		
PBEI: INTERMEDIATE (Cont.)																	
Elementary Total (Cont.)																	
c. Exhibits personal attributes	19	24	21	4.84	4.66	4.14	.374	.481	.727	2	61	5.428	18.431	2.714	.302	8.983	.0004
d. Diagnoses learner characteristics	19	24	21	4.57	4.41	3.90	.607	.653	.700	2	61	5.084	26.274	2.542	.430	5.903	.0045
e. Develops instructional objectives	19	24	21	4.73	4.50	3.85	.562	.510	.792	2	61	8.478	24.255	4.239	.397	10.661	.0001
f. Organizes instruction to achieve objectives	19	24	21	4.63	4.41	4.14	.597	.653	.573	2	61	2.408	22.825	1.204	.374	3.218	.0469
g. Manages learning environment	19	24	21	4.57	4.45	3.90	.692	.721	.700	2	61	5.350	30.399	2.675	.498	5.368	.0071
h. Facilitates instructional objectives	19	23	21	4.63	4.56	3.95	.495	.589	.589	2	60	5.831	19.025	2.915	.317	9.195	.0003
i. Promotes instructional objectives	19	24	21	4.78	4.66	3.90	.418	.481	.624	2	61	9.558	16.300	4.779	.267	17.885	.0000
j. Evaluates achievement of objectives	19	23	21	4.52	4.39	3.90	.611	.583	.700	2	60	4.388	24.024	2.194	.400	5.479	.0065
k. Uses evaluation results	19	23	21	4.47	4.34	3.90	.611	.647	.830	2	60	3.664	29.763	1.832	.496	3.694	.0307
Secondary Total	9	12	8	35.55	36.16	31.75	20.567	17.595	19.775	2	26	101.921	9527.388	50.960	366.438	.139	.8708
a. Exhibits professional qualifications	7	10	6	4.57	4.20	4.33	.534	.632	.516	2	20	.569	6.647	.284	.332	.857	.4394
b. Demonstrates academic preparation	7	10	6	4.14	4.20	3.83	.378	.632	.408	2	20	.535	5.290	.267	.264	1.012	.3812
c. Exhibits personal attributes	7	10	6	4.42	4.00	3.83	.786	.667	.408	2	20	1.278	8.547	.639	.427	1.496	.2481
d. Diagnoses learner characteristics	7	10	6	3.85	3.80	3.66	.690	.421	.516	2	20	.122	5.790	.061	.289	.212	.8110
e. Develops instructional objectives	7	10	6	4.00	3.90	4.00	.577	.737	.632	2	20	.056	8.900	.028	.445	.064	.9387
f. Organizes instruction to achieve objectives	7	10	6	3.85	3.90	3.66	.690	.567	.516	2	20	.213	7.090	.106	.354	.302	.7429
g. Manages learning environment	7	10	6	4.00	3.80	3.50	0.000	.632	.547	2	20	.813	5.100	.406	.255	1.594	.2278
h. Facilitates instructional objectives	7	10	6	3.85	3.90	4.00	.899	.737	.632	2	20	.068	11.757	.034	.587	.059	.9432
i. Promotes instructional interaction	7	10	6	4.28	3.90	3.66	.755	.567	.516	2	20	1.294	7.661	.647	.383	1.690	.2099
j. Evaluates achievement of objectives	7	10	6	4.42	3.90	3.83	.534	.567	.408	2	20	1.508	5.447	.754	.272	2.770	.0867
k. Uses evaluation results	7	10	6	4.28	3.90	4.00	.755	.737	.632	2	20	.628	10.328	.314	.516	.608	.5542